of magnetic elements span substantially from the top end to the bottom end of the process chamber; and

a device for moving said cusp patterns with respect to said wall connected between the plurality of magnetic elements and the process chamber.

REMARKS

Claims 1, 4, 5, 9, 15, and 28 have been amended. Entry of this Amendment and reconsideration of the application are respectfully requested based on the following remarks.

Claims 1 and 28 have been amended to recite that the magnetic elements are on the outside of the wall and extend substantially from the top of the process chamber to the bottom of the process chamber. This is supported by figures 2 and 3A and page 10, lines 6 to 29, of the application. Claim 4 has been amended to state that the length of the magnetic elements extends substantially from the top end to the bottom end of the process chamber. This is supported by figures 2 and 3A. Claim 5 has been amended to recite that there are at least 32 magnetic elements. This is supported by page 10, lines 30-31, of the application. Claim 9 has been amended to recite that each magnetic element is individually rotated around an individual axis of rotation passing through the magnetic element. This is supported by figures 3A-3C and page 14, lines 14-16, of the application. Claim 15 has been rewritten as an independent claim incorporating all the limitations of the claims upon which claim 15 was based.

Rejections under 35 U.S.C. § 103

The Examiner rejected claims 1-4, 6-9, 12-13, and 28-36 as being made obvious by U.S. Patent No. 5,707,452 to Dandl in view of U.S. Patent No. 5,795,451 to Tan et al. The Examiner stated that Dandl shows the invention as claimed including a plasma processing apparatus for processing a substrate 80 comprising: a wall 78 defining the process chamber within which a device 54 is used for igniting and sustaining within the process chamber a plasma for the processing; and a magnetic array having a plurality of magnetic elements being configured to produce a magnetic field establishing a plurality of cusp patterns on the wall, citing Fig. 2 in the description. The Examiner further states that Dandl does not expressly disclose the apparatus comprises a device for changing the cusp pattern, but that Tan discloses a device for rotating magnetic elements, such as permanent magnets, so they can be rotated to shift the magnetic field over time in order for a more uniform processing of the substrate, (co. 1, lines 43-52, and col. 3, lines 9-15) and that it would have been obvious to modify the apparatus disclosed by Dandl to further comprise a device to rotate the

magnetic elements in order to shift the magnetic field over time for optimizing the substrate being processed and the process being performed in the apparatus by reducing the damage of the substrate due to a more uniform processing of the substrate.

In re Vaeck (20 USPQ2nd 1438) states that "Where claimed subject matter has been rejected as obvious in view of a combination of prior art references, a proper analysis under § 103 requires, inter alia, consideration of two factors: (1) whether the prior art would have suggested to those of ordinary skill in the art that they should make the claimed composition or device, or carry out the claimed process; and (2) whether the prior art would also have revealed that in so making or carrying out, those of ordinary skill would have reasonable expectation of success." In addition, *Ex parte Clapp* (227 USPQ 972) states that "To support the conclusion that the claimed combination is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed combination or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the reference." Nothing in Dandl or Tan suggests either expressly or impliedly that the use moving magnetic fields of Dandl would provide a more uniform processing of the substrate. Tan, col. 3, lines 9-18, discloses that a rotating magnetic field creating a changing magnetic field on a sputtering target would increase wafer uniformity. Dandl does not use such a sputtering target, therefore there is no suggestion that rotating magnets of Dandl would be successful in providing a more uniform wafer in Dandl, as required by *In re Vaeck.* In addition, Tan only teaches why moving magnetic fields through a sputtering target would make a more uniform wafer. Since Dandl does not use a sputtering target through which to move magnetic fields, neither Tan nor Dandl suggest rotating the magnets of Dandl.

In addition, the applicant cannot see how the magnets of Dandl may be rotated to cause changing cusp patterns on the chamber walls. Magnets 32, 34, 88, 92 of Dandl are rings. If the rings were rotated, the cusp patterns would not change, since the rings are symmetric. If the magnetic elements 14 were rotated, this would not change the cusp pattern to result in a more uniform processing, since such magnets are within the chamber and appear to cover the top of the chamber. In addition, claims 1 and 28 recite that the magnetic elements are disposed around the periphery of the process chamber. The magnetic elements 14 are within not around the periphery of the process chamber.

In addition, claims 1 and 28 have been amended to require that each magnetic element spans substantially from the top end to the bottom end of the process chamber and are outside of the wall. None of the magnetic elements in Dandl and Tan span substantially from the top end to the bottom end of the process chamber. For these reasons, claims 1 and 28 are not made obvious in by Dandl in view of Tan.

Claims 2-4, 6-8, and 12 are ultimately dependent on claim 1 and for this reason are not made obvious in by Dandl in view of Tan.

Claim 9, as amended, is dependent on claim 8, and further recites that the device for moving the at least on of the magnetic elements comprises a drive for moving a plurality of the magnetic elements individually, wherein each magnetic element is individually rotated around an individual axis of rotation passing through the magnetic element. The Examiner failed to point out anything in Dandl or Tan that discloses moving the magnetic elements individually. In addition, neither Dandl nor Tan disclose that each magnetic element is rotated around an individual axis of rotation passing through the magnetic element. For these reasons, claim 9 is not made obvious in by Dandl in view of Tan.

Claim 13 is dependent on claim 12, and further recites that the device for moving the magnetic array comprises a device for rotating the array around the chamber. The Examiner did not point out how the ring shaped magnets of Dandl would be rotated around the chamber to optimize the apparatus, since these rings are symmetric. The remaining magnets disclosed in Dandl and Tan may be moved within the chamber, but nothing in Dandl or Tan suggests moving these magnets around the chamber. For these reasons, claim 13 is not made obvious in by Dandl in view of Tan.

Claim 29 is dependent on claim 28 and further recites that each magnetic element is axially oriented about the periphery of the process chamber. The magnets in Dandle and Tan are not axially oriented about the periphery of the process chamber. Magnets 14 of Dandl are not around the periphery, but are within. Magnets 32, 34, 88, and 92 Dandl are not axially oriented. The magnets of Tan are neither axially oriented nor about the periphery. For these reasons, claim 29 is not made obvious in by Dandl in view of Tan.

Claim 30 is dependent on claim 29 and further recites a device for rotating at least one magnetic element around an axis of rotation which passes through the magnetic element. None of the magnets in Dandle and Tan are rotated around an axis of rotation, which passes through the magnet. For these reasons, claim 30 is not made obvious in by Dandl in view of Tan.

Claims 31-36 are ultimately dependent on claim 28, and for this reason is not made obvious in by Dandl in view of Tan.

The Examiner rejected claims 5, 10-11, and 18 as being made obvious by U.S. Patent No. 5,707,452 to Dandl in view of U.S. Patent No. 5,795,451 to Tan et al. as applied above

and in further view of U.S. Patent No. 6,113,731 to Shan et al. The Examiner stated that Dandl and Tan do not expressly disclose that the magnetic elements are electromagnets, but that Shan discloses the use of electromagnets for generating an electronically rotating magnetic field in order to reduce damage of the substrate being processed and increase radial uniformity of the plasma process being performed on the substrate and that it would have been obvious to modify Dandl and Tan to comprise electromagnets and shift the magnetic field over time. The Examiner further notes that Shan further disclosed that electromagnets can be replaced by permanent magnets.

Claim 5 is dependent on claim 3, and has been amended to recite that there are at least 32 magnetic elements. At least 32 magnetic elements is not made obvious by Dandl, Tan, and Shan. For these reasons, claim 5, as amended, is not made obvious by Dandl in view of Tan and Shan.

Claims 10-11 are ultimately dependent on claim 3. For this reason, claims 10-11 are not made obvious by Dandl in view of Tan and Shan.

Claim 18 is dependent on claim 2 and further recites that the device for changing the cusp pattern comprises a device for moving at least part of a flux plate with the magnetic field. Dandl, Tan, and Shan do not disclose moving a flux plate. For these reasons claim 18 is not made obvious by Dandl in view of Tan and Shan.

The Examiner rejected claim 14 as being made obvious by U.S. Patent No. 5,707,452 to Dandl in view of U.S. Patent No. 5,795,451 to Tan et al. as applied above and in further view of U.S. Patent No. 6,196,155 B1 to Setoyama et al. The Examiner stated that Dandl and Tan do not expressly disclose a device for moving the array closer and farther away from the chamber, but that Setoyama discloses an apparatus in which the magnetic array is moved farther away and closer to the chamber by a device 14 or 15, in order to change the magnetic field strength and that it would have been obvious to modify Dandl and Tan to comprise a device for moving the magnetic array closer and father away in order to change the magnetic field strength.

Claim 14 is dependent on claim 12 and further recites the device for moving said magnetic array comprises a device for moving said array closer and farther away from said chamber. For these reasons, claim 14 is not made obvious by Dandl in view of Tan and Setoyama.

The Examiner rejected claims 1-4, 6-9, 12-14, and 28-36 as being unpatentable over U.S. Patent 6,196,155 to Setoyama et al. The Examiner stated that Setoyama shows the invention as claimed including a plasma processing apparatus for processing a substrate 4 comprising a wall defining part of the process chamber within which a microwave device is used for igniting and sustaining within the process chamber a plasma for the processing; a magnetic array having a plurality of magnetic elements 20a and 20b, that are disposed within the periphery of the chamber, the plurality of elements being configured to produce a magnetic field establishing a plurality of cusp patterns on the wall; and devices 14 and 15 , for rotating the magnetic elements as to change the cusp pattern of the magnetic field, and which can move the magnetic array closer and farther away from the chamber.

Claims 1 and 28, as amended, recite that each of the plurality of magnetic elements spans substantially from the top end to the bottom end of the process chamber. This is not disclosed or suggested by Setoyama. For this reason, claims 1 and 28, as amended, are not made obvious by Setoyama.

Claims 2-3, 6-8, 12, and 14 are ultimately dependent on claim 1, and for this reason are not made obvious by Setoyama.

Claim 4, as amended, is dependent on claim 3 and further recites that each magnetic element has a length that extends substantially from the top end to the bottom end of the process chamber. This length is not suggested by Setoyama. For these reasons, claim 4, as amended, is not made obvious by Setoyama.

Claim 9, as amended, is dependent on claim 8 and further recites that each magnetic element is individually rotated around an individual axis of rotation passing through the magnetic element. This individual rotation of each magnetic element around an individual axis of rotation passing through the magnetic element is not suggested by Setoyama. For these reasons, claim 9, as amended, is not made obvious by Setoyama.

Claim 13 is dependent on claim 12 and further recites that the device for moving the magnetic array comprises a device for rotating the array around the chamber. This moving the magnetic array around the chamber is not suggested by Setoyama. For these reasons, claim 13 is not made obvious by Setoyama.

Claims 29 and 31-36 are ultimately dependent on claim 28, and for this reason are not made obvious by Setoyama.

Claim 30 is dependent on claim 28 and further recites that the device for changing the cusp pattern comprises a device for rotating at least one magnetic element of the plurality of elements around a rotation axis, which passes through the at least one magnetic element. Setoyama does not suggest rotating a magnet around an axis of rotation that passes through the magnet. Fore these reasons, claim 30 is not made obvious by Setoyama.

The Examiner rejected claims 5, 10-11, and 18 as being unpatentable over U.S. Patent 6,196,155 to Setoyama et al and further in view of U.S. Patent 6,113,731 to Shan et al. The Examiner stated that Setoyama does not expressly disclose the that magnetic elements are electromagnets, but that Shan discloses electromagnets for generating an electronically rotated magnetic field in order to reduce damage to the substrate being processed and increase radial uniformity of the plasma process being performed on the substrate and that it would have been obvious to modify the apparatus of Setoyama to comprise electromagnets.

Claim 5 is dependent on claim 3, and has been amended to recite that there are at least 32 magnetic elements. At least 32 magnetic elements is not made obvious by Setoyama and Shan. For these reasons, claim 5 is not made obvious by Setoyama in view of Shan.

Claims 10-11, and 18 are ultimately dependent on claim 1. The applicant is unsure on how the ring magnets of Setoyama where, for example, the south pole is on the interior of the ring may be made by an electromagnet. For these reasons, claims 10-11, and 18 are not made obvious by Setoyama in view of Shan.

The Examiner objected to claims 15-17, stating that they would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. These claims have been so amended.

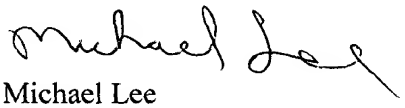
In view of the amendments and arguments set forth herein, it is respectfully submitted that the applicable rejections have been overcome, and that all pending claims are in condition for allowance.

If there are any issues remaining which the Examiner believes could be resolved through either a Supplemental Response or an Examiner's Amendment, the Examiner is respectfully requested to contact the undersigned at (831) 655-2300.

Applicants hereby petition for an extension of time that may be required to maintain the pendency of this case. Any required fee for such extension or any further fee required in

connection with the filing of the Amendment is to be charged to Deposit Account No. 50-0388 (Dkt. No. LAM1P130).

Respectfully submitted,
BEYER WEAVER & THOMAS, LLP



Michael Lee
Reg. No. 31,846

P.O. Box 778
Berkeley, CA 94704-0778
(510) 843-6200